

application could be made without serious burden. See MPEP §803, in which it is stated that “if the search and examination of the entire application can be made without serious burden, the Examiner must examine it on the merits” (emphasis added). It is respectfully submitted that this policy should apply to the present application in order to avoid unnecessary delay and expense to Applicants and duplicative examination by the Patent Office.

### **Supplementary Amendment**

Please amend the above-referenced patent application as follows:

#### **In the Claims:**

Please cancel claims 2, 7, 11, and 14. Please amend claims 1, 5, and 6, as marked up in Appendix A. Please add new claims 21-28. Currently pending claims 1, 3-6, 8-10, 12-13, 15-16, and 21-28 for consideration by the Examiner are as follows:

1. (Amended) A method for constructing a printed circuit board assembly, comprising the steps of:

(a) providing a printed circuit board comprising:

a top surface comprising a top pad, wherein the top pad is electrically connectable to a top component;

a bottom surface; and

a via extending through the circuit board from the top surface to the bottom surface, wherein the via is electrically connected to the top pad, and wherein the via includes an opening at the bottom surface;

(b) forming a plug in the via by inserting a volume of material into the via through the

opening in the via; and

(c) contacting an end of the plug with molten solder, wherein the end of the plug is at the bottom surface, and wherein the plug obstructs flow of the molten solder into the via.

*Concluded*

~~3. The method of claim 1, wherein the via is plugged by a process comprising the steps of:~~

~~screening solder paste into the opening in the via to form a solder mass within the via; and  
reflowing the solder mass, wherein the solder mass is redistributed within the via so as to form the plug.~~

~~4. The method of claim 1, wherein the via is plugged by a process during which a bottom component is installed onto the bottom surface, comprising the steps of:~~

~~screening solder paste, wherein the screening inserts solder paste into the opening in the via to form a solder mass within the via and onto a bottom pad located on the bottom surface to form a solder layer;~~

~~placing the bottom component on the bottom surface, wherein the bottom component is in mechanical and electrical contact with the solder layer; and~~

~~reflowing the solder mass and the solder layer, wherein the solder mass is redistributed within the via so as to form the plug, and wherein the bottom component is mechanically and electrically affixed to the bottom surface.~~

5. (Amended) The method of claim 1, further comprising the steps of:

installing the top component on the top surface, wherein a contact element of the top

component is mechanically and electrically affixed to the top pad;

placing a second component on the printed circuit board; and

wave soldering the bottom surface, wherein the second component is mechanically and electrically affixed to the printed circuit board, and wherein the wave soldering provides said molten solder.

6. (Amended) The method of claim 1, wherein step (b) is preceded by the step of:

installing the top component on the top surface, wherein a contact element of the top component is mechanically and electrically affixed to the top pad;

and wherein step (b) is followed by the steps of:

placing a second component on the printed circuit board; and

wave soldering the bottom surface, wherein the second component is mechanically and electrically affixed to the printed circuit board, and wherein the wave soldering provides said molten solder.

B2

concluded

8. The method of claim 5, wherein the top component is a surface mount device with a lead, wherein the contact element is the lead.

~~9. The method of claim 5, wherein the installation of the top component is accomplished by a process comprising the steps of:~~

~~screening solder paste onto the top pad to form a layer of solder;~~

~~placing the top component on the top surface, wherein the contact element is in~~

mechanical and electrical contact with the top pad; and

reflowing the layer of solder, wherein the contact element is mechanically and electrically affixed to the top pad.

10. The method of claim 5, wherein the second component is a pin-in-hole component comprising a pin-component lead, wherein the pin-in-hole component is placed on the top surface, wherein the pin-component lead is directed from the top surface into a pin hole, and wherein the pin hole extends from the top surface to the bottom surface.

12. A method for constructing a printed circuit board assembly, comprising the steps of:

(a) providing a printed circuit board comprising:

a top surface comprising a top pad, wherein the top pad is electrically connectable to a top component;

a bottom surface;

a middle layer between the top surface and the bottom surface comprising an electrical circuit pattern; and

a via extending through the circuit board from the top surface to the bottom surface, wherein the via is electrically connected to the top pad, wherein the via is electrically connected to the electrical circuit pattern, and wherein the via includes an opening at the bottom surface; and

(b) plugging the via while installing a bottom component onto the bottom surface, by a process comprising the steps of:

screening solder paste, wherein the screening inserts solder paste into the opening in the via to form a solder mass within the via and onto a bottom pad located on the bottom surface to form a solder layer;

placing the bottom component on the bottom surface, wherein the bottom component is in mechanical and electrical contact with the solder layer; and

reflowing the solder mass and the solder layer, wherein the solder mass is redistributed within the via so as to form the plug, and wherein the bottom component is mechanically and electrically affixed to the bottom surface; and

- (c) installing the top component on the top surface, wherein a contact element of the top component is mechanically and electrically affixed to the top pad.

13. The method of claim 12, wherein the installation of the top component in step (c) is accomplished by a process comprising the steps of:

screening solder paste onto the top pad to form a layer of solder;

placing the top component on the top surface, wherein the contact element is in mechanical and electrical contact with the top pad; and

reflowing the layer of solder, wherein the contact element is mechanically and electrically affixed to the top pad.

15. The method of claim 13, further comprising the steps of:

- (d) placing a pin-in-hole component on the top surface, wherein the pin-in-hole component comprises a pin-component lead, wherein the pin-component lead is

directed from the top surface into a pin hole, and wherein the pin hole extends from the top surface to the bottom surface; and

- (e) wave soldering the bottom surface, wherein the pin-in-hole component is mechanically and electrically affixed to the printed circuit board, and wherein a mask is used to shield the bottom component from the effect of wave soldering.

16. The method of claim 13, further comprising the steps of:

- (d) placing a pin-in-hole component on the top surface, wherein the pin-in-hole component comprises a pin-component lead, wherein the pin-component lead is directed from the top surface into a pin hole, and wherein the pin hole extends from the top surface to the bottom surface; and
- (e) wave soldering the bottom surface, wherein the pin-in-hole component is mechanically and electrically affixed to the printed circuit board, and wherein the bottom component is further affixed to the printed circuit board by the wave soldering.

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21. (New) The method of claim 1, wherein the printed circuit board further comprises a conductive lining on an interior wall of the via such that the conductive lining is conductively coupled to the top pad.

22. (New) The method of claim 21, wherein the step of forming a plug comprises forming a solid plug, and wherein in the contacting step the solid plug obstructs flow of the molten solder into the

via.

23. (New) The method of claim 1, wherein the step of forming a plug comprises forming a solid plug, and wherein in the contacting step the solid plug obstructs flow of the molten solder into the via.

24. (New) The method of claim 12, wherein the printed circuit board further comprises a conductive lining on an interior wall of the via such that the conductive lining is conductively coupled to the top pad.

25. (New) The method of claim 24, wherein the method further comprises the step of contacting an end of the plug with molten solder, wherein the end of the plug is at the bottom surface, and wherein the plug obstructs flow of the molten solder into the via.

26. (New) The method of claim 25, further comprising:

placing a first component on the printed circuit board; and

wave soldering the bottom surface, wherein the first component is mechanically and

B3 electrically affixed to the printed circuit board, and wherein the wave soldering provides said molten solder.

27. (New) The method of claim 12, wherein the method further comprises the step of contacting an end of the plug with molten solder, wherein the end of the plug is at the bottom surface, and